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(56) Documents cited

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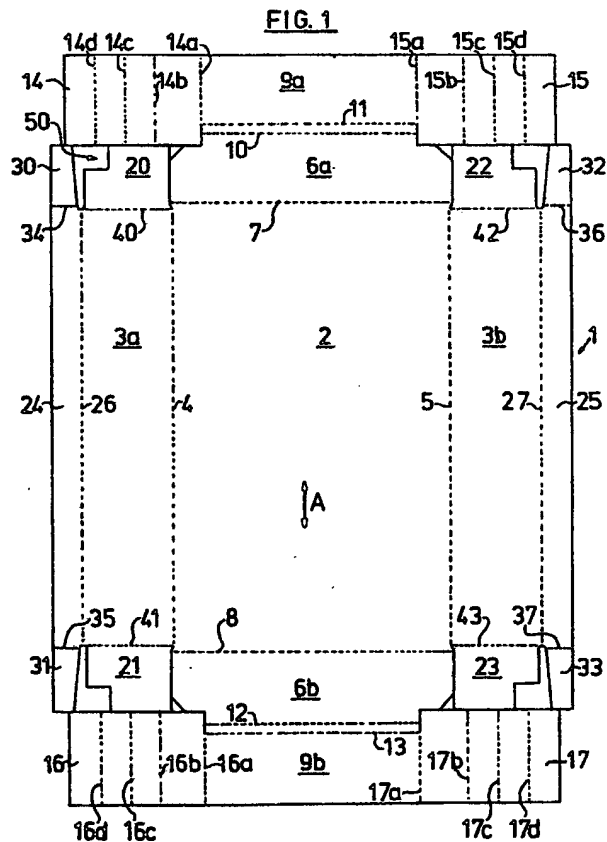
(58) Field of search

B8P

Selected US specifications from IPC sub-class B65D

(54) A stacking tray

(57) A stacking tray formed from a blank comprises a base (2), a first pair of spaced apart walls (3a, 3b), a second pair of spaced apart walls each having an outer wall portion (9a, 9b) integrally joined to the base (2) and an inner wall portion (6a, 6b) and a corner reinforcement at each corner of the tray. Each corner reinforcement is folded from a pair of wing sections (14, 15; 16, 17) integrally joined to each wall of said second pair of spaced apart walls and each having a height greater than a central portion of each wall of said second pair of spaced apart walls.



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FIG. 1

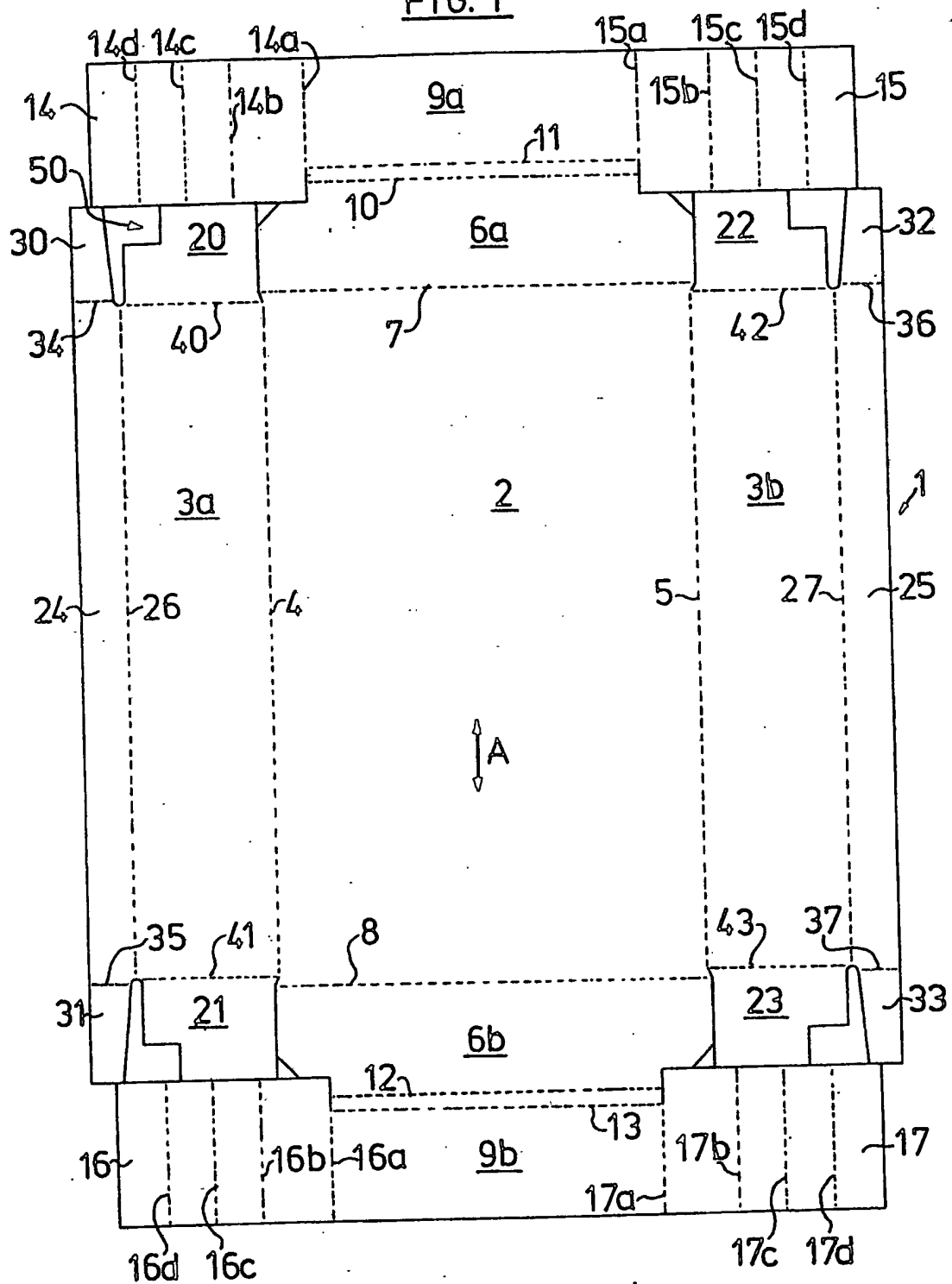
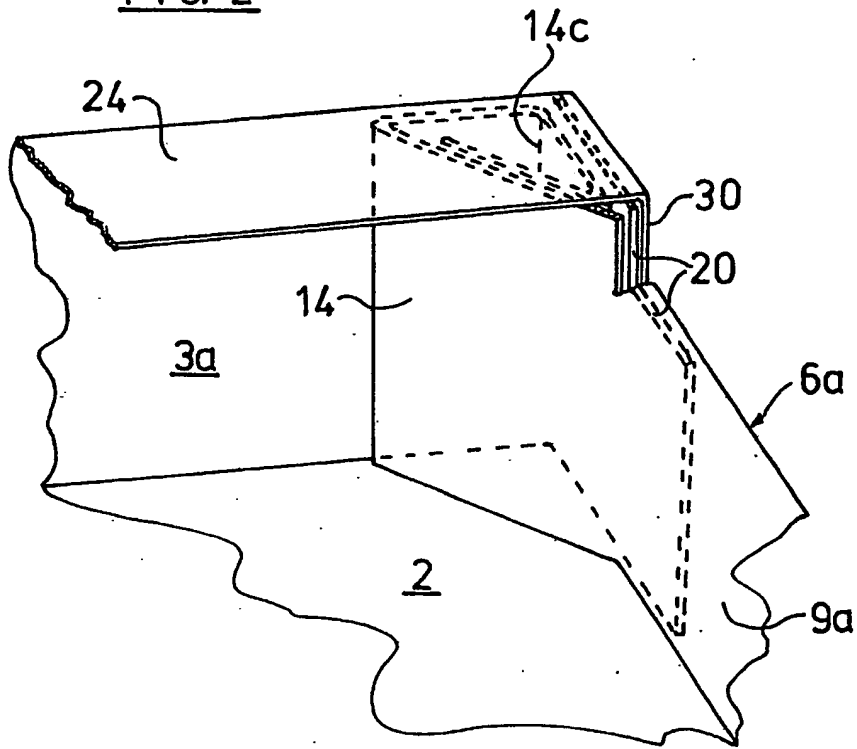


FIG. 2

## SPECIFICATION

### A stacking tray

5 This invention relates to a stacking tray made from a blank of stiff yet foldable packaging material and to such a blank for erection into a stacking tray.

According to one aspect of the invention  
10 there is provided a blank of stiff yet foldable packaging material erectable into a stacking tray, said blank comprising a base section, a first pair of opposed sections integrally joined to the base section and foldable relative  
15 thereto to provide a first pair of spaced apart walls of the tray and a second pair of opposed sections each having a first portion integrally joined to the base section and a second portion, the second pair of opposed sections being foldable relative to the base section  
20 to provide a second pair of spaced apart walls of the tray having inner and outer surfaces provided by the second and first portions, respectively, each of said second pair of  
25 opposed sections having a pair of opposed wing sections integrally joined thereto and foldable to define corner reinforcements in the erected tray having a height greater than at least a central portion of each of said second  
30 pair of spaced apart walls of the tray.

Preferably each of said first pair of opposed sections includes a stacking flange section, said stacking flange sections being arranged so that, in the erected tray, they overlie and are supported by, the corner reinforcements.

Preferably the wing sections are integrally joined to said second portions of the second pair of opposed sections.

The corner reinforcements conveniently  
40 bridge each corner of the tray and are suitably formed by folding the wing sections into corner posts, typically of triangular external cross-section. In the erected tray, the corner posts are preferably hollow and may be filled,  
45 e.g. with wooden filler blocks, for improving the stacking strength of the erected tray.

According to another aspect of the present invention a stacking tray comprises a base section, a first pair of spaced apart walls integrally joined to, and folded upwardly from, the  
50 base section, a second pair of spaced apart walls each comprising an outer wall portion integrally joined to, and extending upwardly from, the base section and an inner wall portion integrally joined to the outer wall portion  
55 and extending downwardly to the base section inwardly of the outer wall portion, and, at each corner of the tray, a reinforcement having a height greater than at least a central  
60 portion of each of said second pair of spaced apart walls, the corner reinforcements being formed from a pair of wing sections integrally joined to each wall of said second pair of spaced apart walls.

65 Preferably each corner reinforcement

bridges, preferably diagonally, across its associated corner. Typically each bridging corner reinforcement is in the form of a corner post which, conveniently, has a substantially triangular external cross-section.

70 Preferably the wing sections are integrally joined to the inner wall portions of said second pair of spaced apart walls.

Suitably each of said first pair of spaced  
75 apart walls has opposed end flaps integrally joined thereto, the said end flaps being sandwiched between the inner and outer wall portions of each second pair of spaced apart walls.

80 An embodiment of the invention will now be described, with reference to the accompanying drawings, in which:

Figure 1 is a plan of a pre-cut and pre-created blank for a stacking tray according to  
85 the invention, and

Figure 2 is a schematic view of one corner of the erected stacking tray.

Figure 1 shows a substantially rectangular blank, generally designated 1, of double-faced  
90 corrugated board having corrugation flutes running in the directions indicated by the double-headed arrow A. The blank 1 comprises a substantially rectangular base section 2 having a first pair of opposed wall panels 3a, 3b  
95 integrally joined thereto along fold lines 4 and 5, respectively, and a second pair of opposed outer wall panels 6a, 6b integrally joined to the base section 2 along fold lines 7 and 8, respectively. Inner wall panels 9a and 9b are  
100 integrally joined to the outer wall panels 6a and 6b, respectively, along pairs of closely spaced apart fold lines 10, 11 and 12, 13, respectively, parallel to the fold lines 7 and 8.

Wing flaps 14, 15 and 16, 17 are integrally  
105 joined to opposite ends of the inner wall panels 9a and 9b, respectively, along respective fold lines 14a, 15a and 16a, 17a parallel to fold lines 4 and 5. Each wing flap 14, 15, 16 and 17 is provided with three spaced-apart  
110 fold lines 14b-d, 15b-d, 16b-d and 17b-d, respectively.

End flaps 20, 21 and 22, 23 are integrally joined to opposite ends of the wall panels 3a and 3b, respectively, along fold lines 40, 41  
115 and 42, 43, respectively. Furthermore, stacking flange panels 24 and 25 are integrally joined to the wall panels 3a and 3b, respectively, along fold lines 26 and 27, each panel 24 and 25 having end tabs 30, 31 and 32,  
120 33 integrally joined thereto along fold lines 34, 35 and 36, 37, respectively.

In Figure 1 all the fold lines are shown as dashed lines and are formed by pre-creasing (although at least some of the fold lines could be formed as lines of perforations) and all cut  
125 lines are shown as full lines. All but fold lines 14a, 15a, 16a and 17a are designed to fold upwardly out of the plane of Figure 1.

130 It is a relatively simple procedure to erect a stacking tray of substantially rectangular sec-

tion from the blank 1 and Figure 2 shows one corner of such an erected stacking tray. In the erected tray, the wing flaps 14-17 are folded to provide corner reinforcements which bridge diagonally across the tray corners. In particular flaps 14-17 are folded about fold lines 14a-d, 15a-d, 16a-d and 17a-d to form prism-shaped corner reinforcements of substantially triangular external cross-section which support opposite ends of inwardly extending stacking flanges formed along opposite sides of the tray by the panels 24 and 25. Each end wall is formed by folding the outer wall panel 6a (6b) upwardly about fold line 7 (8) and folding the inner wall panel 9a (9b) downwardly about fold lines 10 and 11 (12 and 13). Thus the panels 6a (6b) and 9a (9b) form inner and outer wall panels disposed substantially parallel to each other at each end of the stacking tray with end flaps 20 and 22 (21 and 23) sandwiched between the inner and outer wall panels 9a and 6a (9b and 6b). In addition the ends of the tabs 30 and 32 (31 and 33) are sandwiched between the outer wall panel 6a (6b) and the end flaps 20 and 22 (21 and 23). Each of the end flaps 20-23 has a rectangular corner recess 50 (only designated for end flap 20) to enable the end flap to be locked in position between the outer wall panel and the folded over inner wall panel.

A particularly important feature of the design is that the central part of each (end) wall defined by the panels 6a and 9a (6b and 9b) is lower than the other (side) walls of the tray. Thus when a number of the trays are loaded with produce and stacked on top of each other, ventilation and/or rapid freezing of the contained produce is facilitated. Each corner reinforcement formed by the folded wing flaps 14-17 conveniently has a length which matches the internal height of the side walls of the tray (i.e. between the base of the tray and the downwardly facing surface of the tray flanges). The extra height of the corner-bridging stacking reinforcements compared with the height of the central portions of the (end) walls provided by the panels 6a and 9a (6b and 9b) does not require the overall length of the blank 1 to be increased, the additional sheet material for the stacking posts being taken from sheet material which otherwise could be used for the tabs 30-33, end flaps 20-23 and wall panels 6a and 6b.

Various modifications of the design are possible within the scope of the present invention. For example it may be possible to dispense with the stacking flanges all together so that stacked trays are supported directly on the corner posts—although this latter design is not a preferred design. In other designs it may be desirable to provide various locking tabs and slits or slots or to glue various parts of the tray together in its erected condition. The tray may also be made from other types of stiff yet foldable packaging sheet material

to the double-faced corrugated board specifically described. Each of the hollow corner posts formed by folding the wing flaps 14-17 may be filled with a separate filler block, e.g. a wooden block of substantially triangular prism form, to improve the strength of the corner posts and thus the stacking strength of the tray.

## 75 CLAIMS

1. A blank of stiff yet foldable packaging material erectable into a stacking tray, said blank comprising a base section, a first pair of opposed sections integrally joined to the base section and foldable relative thereto to provide a first pair of spaced apart walls of the tray and a second pair of opposed sections each having a first portion integrally joined to the base section and a second portion, the second pair of opposed sections being foldable relative to the base section to provide a second pair of spaced apart walls of the tray having inner and outer surfaces provided by the second and first portions, respectively, each of said second pair of opposed sections having a pair of opposed wing sections integrally joined thereto and foldable to define corner reinforcements in the erected tray having a height greater than at least a central portion of each of said second pair of spaced apart walls of the tray.

2. A blank according to claim 1, in which each of said first pair of opposed sections includes a stacking flange section, said stacking flange sections being arranged so that, in the erected tray, they overlie and are supported by, the corner reinforcements.

3. A blank according to claim 1 or 2, in which the said wing sections are integrally joined to the second portions of said second pair of opposed sections.

4. A blank according to any of the preceding claims, in which each wing section is provided with spaced apart fold lines for enabling the wing section to be folded into a corner post of substantially triangular external cross-section to provide said corner reinforcement.

5. A stacking tray erected from a blank according to any one of the preceding claims.

6. A stacking tray comprising a base section, a first pair of spaced apart walls integrally joined to, and folded upwardly from, the base section, a second pair of spaced apart walls each comprising an outer wall portion integrally joined to, and extending upwardly from, the base section and an inner wall portion integrally joined to the outer wall portion and extending downwardly to the base section inwardly of the outer wall portion, and, at each corner of the tray, a reinforcement having a height greater than at least a central portion of each of said second pair of spaced apart walls, the corner reinforcements being formed from a pair of wing sections integrally joined to each wall of said second pair of

spaced apart walls.

7. A stacking tray according to claim 6, in which each corner reinforcement bridges across its associated corner.

- 5 8. A stacking tray according to claim 6 or 7, in which a stacking flange is foldably connected to the upper edge of each of said first pair of spaced apart walls, the opposite ends of said stacking flanges being supported by
- 10 the said corner reinforcements.

9. A stacking tray according to claim 6, 7 or 8, in which the wing sections are integrally joined to the inner wall portions of said second pair of spaced apart walls.

- 15 10. A stacking tray according to any one of claims 6 to 9, in which each of said first pair of spaced apart walls has opposed end flaps integrally joined thereto, the said end flaps being sandwiched between the inner and outer
- 20 wall portions of each second pair of spaced apart walls.

11. A stacking tray according to any one of claims 5 to 10, in which each corner reinforcement is in the form of a post having a
- 25 substantially triangular external cross-section.

12. A stacking tray according to claim 11, in which each corner post is hollow.

13. A stacking tray according to claim 11, in which each corner post includes a filler
- 30 block.

14. A blank of stiff yet foldable sheet material erectable into a stacking tray, the blank being constructed and arranged substantially as herein described with reference to Figure 1
- 35 of the accompanying drawings.

15. A stacking tray constructed and arranged substantially as herein described with reference to Figures 1 and 2 of the accompanying drawings.